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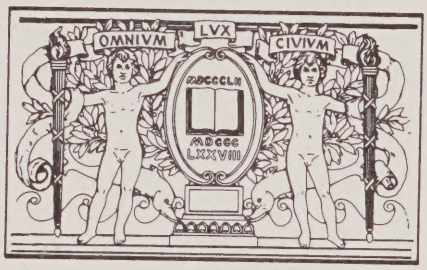

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THE LINKAGE BETWEEN OFFICE DEVELOPMENT AND HOUSING COSTS IN THE CITY OF BOSTON

A Report Prepared for the Boston Redevelopment Authority

By

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January, 1986

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SUMMARY

Downtown office development increases the cost of housing in Boston in a number of ways:

* Downtown office development accommodates employees who move to Boston, increasing demand for housing and driving up its cost for all residents.

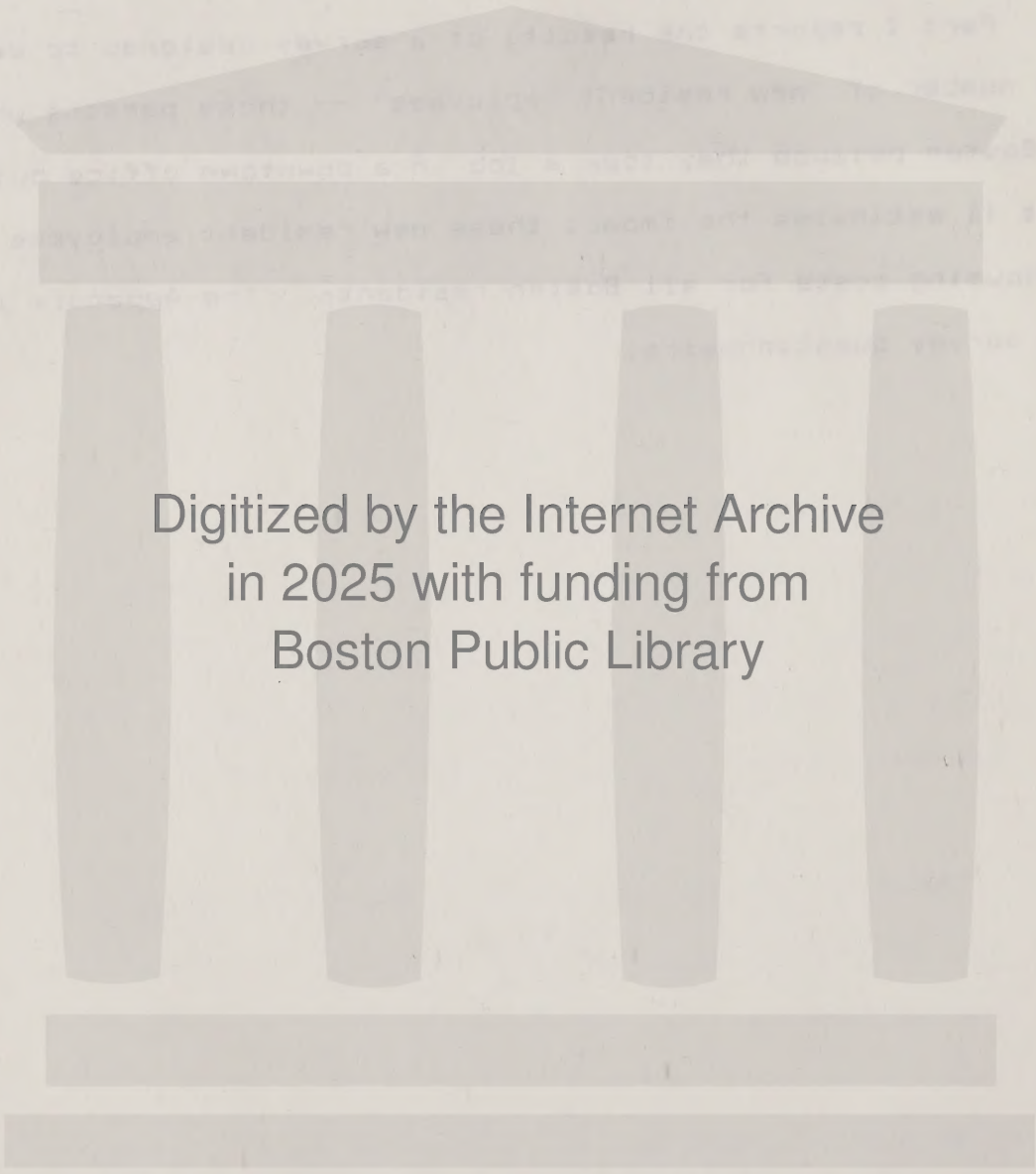
* Downtown office development has an employment multiplier effect. Non-office businesses will be started or expanded to service new office buildings and some of the multiplier non-office employees will move to Boston, further increasing housing demand and costs.

* Downtown office development increases land prices, making land a more expensive input in construction of residences.

This report explores the linkage between downtown office development and housing costs in Boston. It concludes that one new resident employee arrives for every 3,103 square feet of office space and that new resident employees increase rental housing costs in the City two percent, or $11.28 for each square

foot of downtown office space developed.

Part I reports the results of a survey designed to estimate the number of "new resident employees" -- those persons who moved to Boston because they took a job in a downtown office building. Part II estimates the impact these new resident employees have had on housing costs for all Boston residents. The Appendix includes the survey questionnaire.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I. OFFICE DEVELOPMENT AND RESIDENTIAL MIGRATION

Introduction

In the last decade, Boston's office space inventory and office employment base have increased substantially. (See Table 1).[1] Office projects currently planned or under construction suggest that this boom will continue over the next decade.

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[1]In 1984, Boston ranked first among the nation's cities in new office space construction per capita and fourth in total new office space construction. See Boston Redevelopment Authority (Alexander Ganz), "A Profile of Boston," Background Paper, December 1985, p.1. For the first nine months of 1985, 1.2 million square feet were added. Projections for 1986 and beyond indicate a growth rate of 1.3 to 1.5 million square feet per year. Office employees made up 40 percent of the net new jobs in Boston from 1976 to 1984, and office employment is projected to grow by 56,000 jobs over the next decade. See Boston Redevelopment Authority (Alexander Ganz and Gregory Perkins), "Boston's Recent Performance and Prospects for the Future; The Outlook for the Demand and Supply of Office Space, Hotel Rooms and Housing," March 29, 1985, p.1.

Growth in office employment has been accompanied by a resurgence of population growth. After losing residents for three decades, the City's population has been increasing since 1980 and is projected to expand by 40,000 between 1985 and 1995. Such growth has generated increased demand for rental and owner-occupied housing in the City. Vacancy rates for rental housing have fallen to two percent and housing costs have risen sharply. In 1984, for example, housing costs grew faster in Boston than in any other city across the nation, registering a 23 percent increase. See Ganz and Perkins, id., at p.5.

TABLE 1

PRIVATE OFFICE EMPLOYMENT
AND PRIVATE OFFICE SPACE,
1976-1995

YEAR	PRIVATE OFFICE EMPLOYMENT	PRIVATE OFFICE SPACE (in sq. ft.)
1976	124,000	35,900,000
1980	140,000	37,000,000
1984	153,000	42,200,000
1990	189,000 (projected)	50,100,000 (projected)
1995	202,000 (projected)	57,100,000 (projected)

Sources: Boston Redevelopment Authority (Jeffrey Brown), "Downtown Boston Economy, Employment and Labor Force," November, 1985, Tables E7 and E8. Boston Redevelopment Authority (Jeffrey Brown and Gregory Perkins), "Boston Employment, Citywide, Downtown, Downtown Office, and the Remainder of Boston 1976-1984 and Projections to 1990 and 1995," Table 7; and Ganz and Perkins, p.9, 10, and Table 15 (see Ftn. 1).

Although a person's residential location decision depends on a variety of interdependent factors, including availability and

cost of transportation, cost of housing at different locations, "quality" of neighborhoods and lifestyle choices, workplace location is of central importance. Because travelling to work is costly in time and money, other things being equal, people prefer to live close to their workplace.[2] Thus, "new resident employees" obtaining jobs in or connected to Boston's downtown office buildings may choose to move to the City. Such "new resident employees" may include persons relocating to Boston from other areas across the country, or persons moving from Boston's suburbs.

New Resident Employees

A survey was conducted to estimate the impact downtown office development has had on residential location decisions of office employees.[3] Of the 1,237 office employees responding to the survey, 22 percent live in Boston, while 78 percent live elsewhere. About one in three Boston residents, or about seven percent of all downtown office employees, answered that a job taken in a downtown office building was a major reason that they

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[2]This preference is well-documented in urban economics literature. See, e.g., Kain, "The Journey to Work as a Determinator of Residential Location," Papers and Proceedings of the Regional Science Association, Volume 9, 1962; Mills, Urban Economics, McGraw-Hill, 1985.

[3]For a copy of the survey questionnaire, see Appendix.

moved to Boston."

Using evidence of recent Boston office employment growth, it is possible to estimate residential migration that has occurred as a result of downtown office development. Between 1976 and 1984, office employment in downtown Boston increased by 29,000 workers. (See Table 1). The survey results indicate that seven percent, or 2,030 of these workers, moved to the City as a result of their employment.[3]

Expressed in terms of office space, office space grew by 6.3 million square feet for the period from 1976 to 1984, accommodating 2,030 new resident employees. Dividing office space growth by new resident employees reveals that one new resident arrived for every 3,103 square feet of office space added, or every thousand square feet of office space attracts .31 new

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"268 of the survey respondents were Boston residents, while 939 resided elsewhere. Of the 268 Boston residents, 85 answered that a job taken in a downtown office building was a major reason that they moved to the City. Because of the number and interdependence of factors that enter into the residential location decision, people may not think of any one factor as decisive. This is especially true when people are asked to identify in retrospect their reasons for moving. For this study, persons stating that their downtown office employment was a major reason for their move to Boston are counted as "new resident employees."

[3]Between 1985 and 1995, office employment is projected to grow by an additional 49,000 workers. The survey results indicate that 3,430 of these workers will move to the City because of their jobs.

residents.[6]

Additional Residential Migration

Downtown office development has accounted for more residential migration than that estimated from the foregoing survey results.

First, by surveying only current office employees, the survey did not reach persons who moved to Boston for a job in a downtown office building but who no longer work in an office building. Thus, the sample percentage of migrant workers would tend to underestimate their true proportion in the population.

Second, office development has a "multiplier" effect on non-

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[6]Whenever analysis is conducted on the basis of a sample rather than the entire population, errors may arise because the sample chosen may not truly represent the population. The likelihood of sampling error diminishes as the size of the sample increases. Given the large size of this sample (1,237 observations), the probability that an unrepresentative sample was selected is small.

Conclusions based on survey results also may be misleading if some groups in the population are more likely to participate in the survey than others. To ensure that all office workers had an equal chance to participate, surveys were collected at eleven different buildings at hours when both professional and clerical workers were likely to arrive. Since the questionnaire was distributed in the front of building office lobby entrances, persons who park in basement garages were unlikely to be counted. Only a few of the buildings, however, have such basement garages, and the number of parking spaces is small.

office development. Some people move to the City to work in non-office employment created to support the expanded level of office employment and activity. This "non-office employment" includes such occupations as janitors, messengers, copy machine operators and restaurant workers.

These two reasons make this study's numerical estimate of residential migration caused by downtown office development a conservative one[7].

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[7]Some people may contend that growth of office worker employers, not growth of office development, is responsible for new resident employees. This allocation of ultimate responsibility is beyond the purview of this report.

II. NEW RESIDENT EMPLOYEES AND HOUSING COSTS

Introduction

Downtown office building employees entering the Boston housing market place additional pressure on an already tight supply of housing. As observed supra, Ftn.1, vacancy rates have fallen to two percent for rental housing, and they stand at four percent overall. The increased demand for housing caused by downtown office development has been partly responsible for the dramatic rise in housing costs. Office workers seeking housing in such neighborhoods as Beacon Hill and Back Bay have driven up the price of existing housing throughout the City. Employees seeking housing in such neighborhoods as the South End and Roxbury have had similar effects, but the impact[8] has been especially felt by low- and moderate-income residents.

Existing homeowners escape the increase in housing costs created by office development, through capital gains in the value of the homes they own. Existing renters, on the other hand, do

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[8]The impact of such additional housing demand takes many forms, including the well-documented "gentrification" of neighborhoods. Moderate-income office employees are bidding away housing from low-income residents.

not enjoy capital gains.[9] Thus, the increase in housing costs created by office development falls mainly on renters, who tend to be middle and lower income individuals.

This section will estimate the increase in cost borne by existing tenants of rental properties as a result of downtown office development. It will also estimate the cost of directly supplying new housing to accommodate the number of new resident employees created by downtown office development.

Calculations

As indicated in Part I of this report, downtown office development has accommodated the in-migration of 2,030 new resident employees between 1976 and 1984. Assuming the average residence in Boston contains 1.4 workers[10], this created demands for 1,450 new residences. Sixty-eight percent of all Boston housing units are rental units.[11] Assuming that new resident employees are as likely to live in apartments as existing Boston

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[9]Landlords of rental units will reap capital gains caused by additional demand and resulting price increases.

[10]Boston Redevelopment Authority (Gregory Perkins), "Informal Memo," December 1985.

[11]See Ftn.1 (Ganz), p.2.

residents, then office development between 1976 and 1984 created a demand for 986 additional rental units.

To know what impact this additional demand has had on housing costs, it is necessary to know what housing costs would be had no additional demand occurred as a result of office development. While this is impossible to determine with absolute certainty, one may use evidence from the Boston housing market, together with studies of housing markets in other cities, to make an educated guess about the impact of adding 986 additional renters.

Studies of urban housing markets suggest that the "price elasticity of demand" for housing is approximately one.[12] This means that a one percent increase (decrease) in the demand for housing leads to a one percent increase (decrease) in its price.

In 1984, there were approximately 151,000 private rental housing units in Boston.[13] Assuming an average annual vacancy

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[12]De Leeuw, "The Demand for Housing," Review of Economics and Statistics, 1971; Mayo, "Theory and Estimation in the Economics of Housing Demand," Paper Presented at the North American Meetings of the Econometric Society, Chicago, August 1978.

[13]Boston Redevelopment Authority (Rolf Goetze), "Boston's Housing Stock Changes, 1980 to 1985," 1985, p.2. In 1985, the closest year for which data are available, there were 249,000 housing units in the City of Boston, of which 68% or 169,000 were rental. Subtracting the 18,000 non-market units operated by the Boston Housing Authority leaves 151,000 units whose rents generally adjust to market conditions.

rate of five percent, there were, on average, approximately 7,550 rental units available annually. The additional annual demand created by office development reduces the number of available apartments by two percent. Assuming a price elasticity of demand of one, this two percent increase in the demand for available apartments -- a two percent decline in the amount available to existing residents -- results in rental costs that are two percent higher than they would have been had there been no in-migration.[14]

Current Boston renters must compete with new renters in the apartment market. As a consequence, higher rents will be paid not only by new renters, but by all renters.[15] For existing Boston renters, the full impact of additional renters on their housing costs will be felt when landlords recognize that increased demand

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[14]This approach implicitly assumes that in-migrants affect the demand but not the supply of housing. The impact of new renters on the demand for housing is immediate, but the supply response is likely to be delayed. Given the current economics of rental housing development and the time required to plan and construct new units, several years may pass before higher rents resulting from additional renters are translated into additional units. Because the supply of land in the City is fixed, even when builders construct more rental housing, rents will remain somewhat higher, reflecting the increased scarcity of land.

[15]When the supply of apartments is fixed, rents are determined by competition among renters. Rents, like other prices, are determined "at the margin." That is, prices are largely determined not by how much the average but how much the most anxious renter is willing to pay. Rents on all apartments will eventually increase as a result of the in-migration.

for apartments allows them to charge more rent for their units and when expiration of leases permits them to do so.

Using an average rent of $390 per month[16], the in-migration of residents caused by office development results in eventual rent increases of about $94 per year for the average apartment. Assuming 151,000 apartments whose prices adjust to market conditions, annual apartment rents in Boston are $14.1 million higher than they would have been in the absence of new resident employees working in downtown office buildings.

Between 1980 and 1984, the Boston office space inventory grew by five million square feet, or about 1.25 million square feet per year. Dividing the average annual addition to office space by the annual increased rental costs suggests that <u>each square foot of downtown office space eventually raises annual rental housing costs by $11.28</u>. However, this cost increase prevails only until the supply of housing ultimately increases in adjustment to the higher rents offered for apartments.[17] Assuming a five-year period for supply adjustment, this would result in a <u>present value</u>

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[16]The 1985 Household Survey conducted by The Center for Survey Research at the University of Massachusetts at Boston reported an average rent in the City of $390 per month.

[17]<u>See</u> Footnote 14.

housing cost of $42.76.[18] This may be compared with the current Development Impact Project fee, described in Article 26 of the Boston Zoning Code, of $5 spread out over 12 years, or $.42 per year, for a present value of $2.86.

As indicated earlier, the estimate of housing cost is conservative for two reasons. First, the estimate is based on low estimates of the amount of migration actually resulting from downtown office development. Second, the calculation considers only the direct impact of increased demand on housing prices. There are other channels through which office development might drive up housing prices. Office development increases the competition for land, and resulting higher land prices increase the cost of residential construction.

Cost of Supplying New Housing For New Resident Employees

If new resident employees did not compete for the existing supply of housing, then the above-estimated impact on housing costs would not occur. Thus, an alternative way to address the impact of downtown office development on housing costs would be to estimate the cost of supplying housing for the new resident

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[18]This is calculated at a discount rate of 10%.

employees accommodated by downtown office development. That is, how much would it cost to supply 986 additional rental units?[17]

Assuming a cost of $75,000 per apartment unit, the total cost to house the new resident employees would be $74 million. Dividing this by 6.3 million square feet of office space built between 1976 and 1984 produces a total cost per square foot of $11.75.

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[17]This is not to suggest that rental housing should actually be built for the new resident employees. Rather, it is a method for estimating how much it would cost to keep the new resident employee renters from imposing costs on existing renters.

III. APPENDIX: SURVEY QUESTIONNAIRE

In order to estimate the impact downtown office development construction has had on residential migration, a survey was conducted to determine what proportion of current downtown office employees moved to Boston because of jobs they took in downtown office buildings.

Employees at eleven of the fourteen major private office buildings constructed since 1975 were surveyed. The buildings included:

Hancock Tower
50 Staniford Street
Blue Cross, 100 Summer Street
175 Federal Street
60 State Street
One Post Office Square
50 Milk Street
155 Federal Street
One Financial Center
Exchange Place
265 Franklin Street

A pre-test survey was conducted at the John Hancock building December 30, 1985, and the remaining buildings were surveyed on January 6 and 7, 1986. Prepaid mail-in survey forms were distributed to individuals as they entered the eleven office buildings between the hours of 7:30 and 9:15 am.

The text of the survey questionnaire appears on the following pages.

SURVEY

Urban Research Systems is conducting a survey of employment and commuting patterns in the City of Boston. Please take a few moments to answer the following questions and drop the postcard in a mailbox. Your cooperation is appreciated.

1. Do you work in a downtown Boston office building?

___ YES (_____)

Street address

___ NO

2. What is your occupation? _____

3. Do you live:

___ In Boston

___ Elsewhere (_____)

Name of town

4. How do you travel to work?

___Walk ___Auto ___Bus ___Subway/trolley ___Commuter rail

For Boston residents only:

5. Did you live in Boston before you took a job in a downtown Boston office building?

___ YES

___ NO

6. If you answered **NO** to question 5:
Was a job you took in a downtown Boston office building a major reason that you moved to Boston?

___ YES

___ NO

Thank you very much.